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| EXAMINER |
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KAPLAN, HAL IRA

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| ART UNIT | PAPER NUMBER |
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2836

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

10/063,290

Applicant(s)

ZAREI, SHAHRAM

Examiner

Hal I. Kaplan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2005.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☒ Claim(s) 10-22 is/are allowed.
 6) ☒ Claim(s) 1-9 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☒ The drawing(s) filed on 09 April 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date _____.
 4) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date _____.
 5) ☐ Notice of Informal Patent Application (PTO-152)
 6) ☐ Other: _____.

DETAILED ACTION

Receipt is acknowledged of the amendments to the specification and claims, and the remarks, filed August 26, 2005, kindly submitted by applicant.

Drawings

1. The corrected drawing sheet referred to in paragraph 3 of the remarks was not received. Applicant is required to resubmit the corrected drawing sheet.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by the US patent of Ruthlein et al. (5,698,905).

As to claim 1, Ruthlein, drawn to a hybrid propulsion system for a motor vehicle and a method of operating the hybrid propulsion system, teaches, in Figures 1 and 1a, a power supply (7,13) that is read on the claimed soft hybrid electric vehicle power supply circuit, comprising: a load sensor generating a load signal (see column 7, lines 31-37); a high-voltage bus (9) supplying a high voltage (see column 6, lines 58-60) for a high-voltage load (1) other than an engine starter (see column 7, lines 50-52); a low-voltage bus electrically coupled to and supplying a low-voltage to a low-voltage load (see column 7, lines 50-58); and a converter circuit (25) electrically coupled to the high-voltage bus (9), the low-voltage bus, and the high-voltage load, the converter circuit (25)

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maintaining a predetermined minimum voltage level (500-1000 V; see column 6, lines 58-60) on the high-voltage load by switching between the high-voltage bus (9) and the low-voltage bus in response to the load signal (see column 7, lines 58-67).

As to claim 6, the circuit of Ruthlein further comprises a high-voltage energy storage device (27) electrically coupled to and supplying power to the high-voltage bus (9) (see column 8, lines 24-26).

As to claim 7, the circuit of Ruthlein further comprises a low-voltage energy storage device (21) electrically coupled to and supplying power to the low-voltage bus (see column 7, lines 54-56).

As to claim 8, the converter circuit (25) of Ruthlein maintains a predetermined minimum voltage level (500-1000 V; see column 6, lines 58-60) during soft hybrid-electric vehicle engine high-loading periods (see column 8, lines 19-24).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruthlein in view of the US patent of Gale et al. (6,304,056).

Ruthlein teaches all of the claimed elements, as set forth above, except for an integrated starter generator (ISG) supplying power to the high-voltage bus or an engine, an ISG control circuit electrically coupled to the integrated starter generator and the high-voltage bus, the ISG control circuit signaling said ISG in response to the load signal and adjusting performance of the ISG, and the ISG control circuit comprising an inverter and an ISG controller.

Ruthlein teaches a generator (7) supplying power to the high-voltage bus (9) (see column 6, lines 56-57), but the generator of Ruthlein is not an ISG.

As to claim 2, Gale, drawn to a pulsed charge power delivery circuit for a vehicle having a combined starter/alternator, teaches, in Figure 1, an integrated starter generator (ISG) (10) supplying power to a high-voltage bus (see column 2, line 65 through column 3, line 2; and column 3, lines 8-9). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to build the circuit of Ruthlein with the ISG of Gale, because an ISG is smaller and takes up less space than a starter and alternator would separately, and the ISG of Gale increases efficiency.

As to claim 3, the ISG (10) of Gale further comprises: an ISG control circuit (12,16) electrically coupled to the ISG (10) and the high-voltage bus, the ISG control circuit (12,16) signaling the ISG (10) in response to a load signal and adjusting performance of the ISG (10) (see column 3, lines 30-36 and 57-60).

As to claim 4, the ISG control circuit (12,16) of Gale further comprises: an inverter (12) processing electrical power between the high-voltage bus and the ISG (10); and an ISG controller (16) electrically coupled to the inverter (12) and determining when to process electrical power (see column 3, lines 57-60).

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ruthlein in view of the US patent of Itoh et al. (5,796,175), and further in view of the US patent of Masberg et al. (6,177,734).

As to claim 5, Ruthlein teaches all of the claimed elements, as set forth above, except for a bi-directional switch and a bi-directional converter electrically coupled to the bi-directional switch and controlling the switch, the bi-directional converter controlling the direction of voltage conversion from either the high-voltage bus to the low-voltage bus or from the low-voltage bus to the high-voltage bus to maintain the predetermined minimum voltage level on the high-voltage load.

Itoh, drawn to a power supply control device for an electric vehicle, teaches, in Figure 2, a bi-directional switch (3) (see column 4, line 6). Masberg, drawn to a starter/generator for an internal combustion engine, especially an engine of a motor vehicle, teaches, in Figure 1, a bi-directional converter (18) (see column 13, lines 31-34), the converter controlling the direction of voltage conversion from either the high-voltage bus to the low-voltage bus (23) or from the low-voltage bus (23) to the high-voltage bus to maintain a predetermined minimum voltage level on the high-voltage load (see column 13, lines 54-56 and column 14, lines 46-50). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to build the circuit of Ruthlein

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with the bi-directional switch of Itoh, and the bi-directional converter of Masberg controlling the bi-directional switch, in order to allow the high-voltage load to remain at a sufficiently high voltage regardless of the voltage on the low-voltage bus.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ruthlein in view of the US patent of Arai et al. (6,191,558).

Ruthlein teaches all of the claimed elements, as set forth above, except for the predetermined minimum voltage level being approximately 30 volts.

Arai, drawn to a battery controller and junction box with the same battery controller, teaches, in Figure 1, a power supply circuit for a vehicle comprising a converter circuit maintaining a predetermined minimum voltage of approximately 30 volts (36 V; see column 3, line 57) on a high-voltage load (3) by switching between a high-voltage bus (7,9) and a low-voltage bus (4) (see column 3, line 47 through column 4, line 10). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to build the circuit of Ruthlein with the 36 V predetermined minimum voltage of Arai, because 36 V is much less likely to cause a fault or damage to components than 500-1000 V.

Allowable Subject Matter

9. Claims 10-22 allowed.

10. The following is an examiner's statement of reasons for allowance:

Claims 10 and 19 are allowed because, as explained by applicant, claim 10 does not read on the prior art.

Claims 11 and 14-18 are allowed because they depend from claim 10.

Claim 12 is allowed because it depends from claim 11.

Claim 13 is allowed because it depends from claim 12.

Claims 20 and 22 are allowed because they depend from claim 19.

Claim 21 is allowed because it depends from claim 20.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

11. Applicant's arguments, see Remarks, filed August 26, 2005, with respect to the objections to the specification because of informality reasons have been fully considered and are persuasive. The objection to the specification has been overcome and is respectfully withdrawn.

12. Applicant's arguments, see Remarks, filed August 26, 2005, with respect to the objections to the drawings because Figure 1 fails to show an item having numerical designator 35, and because numerical designator 62 should be mentioned in the written description associated with Figure 2, have been fully considered and are persuasive. The objections to the drawings because Figure 1 fails to show an item having numerical designator 35, and because numerical designator 62 should be mentioned in the written description associated with Figure 2, have been overcome and are respectfully withdrawn.

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13. Applicant's arguments, see Remarks, filed August 26, 2005, with respect to the objections to claims 10, 19, and 21 for informality reasons have been fully considered and are persuasive. The objections to claims 10, 19, and 21 for informality reasons have been overcome and are respectfully withdrawn.

14. Applicant's arguments, see Remarks, filed August 26, 2005, with respect to the objection to claim 10 because the specification does not contain a written description of the invention have been fully considered and are persuasive. The objection to claim 10 because the specification does not contain a written description of the invention has been overcome and is respectfully withdrawn.

15. Applicant's arguments, see Remarks, filed August 26, 2005, with respect to the rejection of claim 22 under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement have been fully considered and are persuasive. The rejection of claim 22 has been overcome and is respectfully withdrawn.

16. Applicant's arguments filed August 26, 2005, with respect to the rejections of claims 1 and 6-8 have been fully considered but they are not persuasive. Applicant states that the operation of a circuit between 500V and 1000V is irrelevant and provides no suggestion of switching between a high-voltage bus and a low-voltage bus. The voltage level of between 500V and 1000V was cited merely as a predetermined minimum voltage and not as a teaching of switching between a high-voltage bus and a low-voltage bus.

Applicant also states that the disclosure in Ruthlein of converting high-voltage to

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low-voltage does not provide any suggestion of switching between a high-voltage bus and a low-voltage bus. The conversion of Ruthlein constitutes a switching, or changing, between high-voltage and low-voltage. The intermediate circuit 9 acts as a high-voltage bus with respect to the low-voltage bus. Applicant further states that the claimed high-voltage bus and low-voltage bus are not utilized simultaneously. The claims do not state that the high-voltage bus and the low-voltage bus must be utilized simultaneously. However, Ruthlein, in column 7, lines 50-60, states that the intermediate circuit/high-voltage bus 9 and the low-voltage bus are utilized simultaneously. The intermediate circuit 9 supplies power to the electric motors 1 (see column 7, lines 51-52), while at the same time, the low voltage bus supplies power to other loads 23 (see column 7, lines 54-60).

Applicant further states that Ruthlein does not provide a high-voltage bus in which devices other than the generator/starter 7 are supplied high-voltage through up-conversion, and that the motor 1 is not supplied power from the low-voltage system. However, Ruthlein states in column 7, lines 51-52, that the motor 1 is supplied high-voltage through up-conversion via the high-voltage bus 9.

17. Applicant's arguments filed August 26, 2005, with respect to the rejections of claims 2-4 have been fully considered but they are not persuasive. Claims 2-4 depend from claim 1, which stands rejected, and applicant submitted no further arguments.

18. Applicant's arguments, see Remarks, filed August 26, 2005, with respect to the rejection(s) of claim(s) 5 under 35 U.S.C. 103(a) as being unpatentable over Ruthlein in view of Itoh et al. have been fully considered and are persuasive. Therefore, the

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rejection has been respectfully withdrawn. However, upon further consideration, a new ground(s) of rejection is made under 35 U.S.C. 103(a) over Ruthlein in view of Itoh, and further in view of the US patent of Masberg et al. (6,177,734).

Applicant states that the switch of Itoh is not bi-directional because current from the high-voltage battery 4 is supplied to the inverter 1 and the converter 7 only when the switch is closed. However, applicant states in paragraph 34, lines 1-2 of the specification that the high-voltage bus of the invention likewise supplies current to the high-voltage loads only when the switch is closed. When the switch is open, current to the high-voltage loads is supplied from the low-voltage bus.

19. Applicant's arguments, see Remarks, filed August 26, 2005, with respect to the rejection of claims 10, 15-17, and 19 under 35 U.S.C. 103(a) as being anticipated by Ruthlein have been fully considered and are persuasive. The rejection of claims 10, 15-17, and 19 has been overcome and is respectfully withdrawn.

20. Applicant's arguments, see Remarks, filed August 26, 2005, with respect to the rejections of claims 11-13, 14, 18, and 21 have been fully considered and are persuasive. The rejection of claims 11-13, 14, 18, and 21 has been overcome and is respectfully withdrawn.

21. The rejection of Claim 20 under 35 U.S.C. 103(a) as being unpatentable over Ruthlein in view of Itoh, and further in view of the US patent of Kanazawa is respectfully withdrawn because Claim 20 depends from claim 19, which is presently in condition for allowance.

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The US patent of Kitamine et al. (5,998,884) discloses a similar device. The US patent of Masberg et al. (6,365,983) discloses a similar bi-directional converter.

23. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hal I. Kaplan whose telephone number is 571-272-8587. The examiner can normally be reached on M-F 8:30-5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2800 x36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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